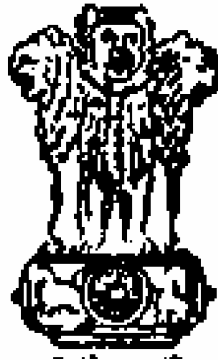


Effective From: Year 1983

Specification No. IRS: S 65 -1983

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**



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**INDIAN RAILWAY STANDARD SPECIFICATION
FOR
CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS
ON 25 KV 50 Hz AC ELECTRIFIED SECTION.**

(TENTATIVE)

SPECIFICATION NO. IRS: S 65 - 1983

With Amendments 1 & 2

Number of pages: 22

**SIGNAL DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
LUCKNOW-226011**

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION****DOCUMENT DATA SHEET**

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Authors Director/ Signal/ RDSO			
Approved by Sr. Executive Director/ Signal, RDSO			
Abstract This document specifies Technical specification for Choke Coil For Signal Rail Track Circuits On 25 kv 50 Hz AC Electrified Section.			

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION****DOCUMENT CONTROL SHEET**

<u>NAME</u>	<u>ORGANIZATION</u>	<u>FUNCTION</u>	<u>LEVEL</u>
Director/ Signal	RDSO	Member	Prepare
Sr. Executive Director/ Signal	RDSO	-	Approve

Converted into electronic form on 15.4.2008

Prepared By – Sri K.C.Bharti SSE / Signal

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**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION****AMENDMENTS**

Version	Chapter/ Annexure	Amendment	Effective date
IRS: S 65/1983	-	First Issue	1983
IRS: S 65/1983	-	Amendment 1	February 2001
IRS: S 65/1983	-	Amendment 2	June 2002 (Implementation of amendment No.2 to specification IRS:S65/83 has been postponed vide letter No. STS/E/BTC/Chockes dtd 28.7.03

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION****TABLE OF CONTENTS**

S.No.	ITEM	PAGE NUMBER
0.0	FOREWORD.	- 6 -
1.0	SCOPE.	- 7 -
2.0	TERMINOLOGY.	- 7 -
3.0	REQUIREMENTS.	- 7 -
4.0	MARKING.	- 9 -
5.0	TESTS AND PERFORMANCE REQUIRMENTS.	- 9 -
6.0	CONDITION OF SUPPLY AND PACKING .	- 12 -
7.0	APPENDIX 'A'	- 13 -
8.0	APPENDIX 'B'	- 14 -
9.0	AMENDMENT No.-1	17 & 18
10.0	AMENDMENT No.-2	20 & 21

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

Government of India
MINISTRY OF RAILWAYS
(Railway Board)



**INDIAN RAILWAY STANDARD SPECIFICATION
FOR
CHOKE COIL FOR SINGLE RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

(Tentative)

Serial No. S 65-83

0. FOREWORD

- 0.1 This specification is issued under THE FIXED Serial No. S 65 followed by the year of original adoption as standard or in the event of revision the year of last revision.

ADOPTED 1983

- 0.2 This specification requires references to the following Indian Railway Standard (IRS) and Indian Standard (IS) specifications:

IRS: S 23	Electrical signalling and interlocking equipment
IS: 589	Basic climatic & mechanical durability tests for components for electronic and electrical equipment.
IS: 4218	ISO Metric screw threads
IS: 4800 (Part IV)	Enamelled round winding wires Part IV Wires with high mechanical properties.

- 0.3 Wherever in this specification, any of the above mentioned specifications is referred to by number only without mentioning the year of issue, the latest issue of the specification is implied; otherwise the particular issue referred to is meant.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

- 0.4 This standard covers the general requirements & methods of measurement of various parameters of the Choke Coil.
- 0.5 This specification is intended chiefly to cover the technical provisions relating to the supply of materials and does not include all the necessary provisions of a contract.

1. SCOPE

- 1.1 This specification covers the general requirements and methods of test for judging the mechanical, electrical and climatic properties of choke coils which are intended for use in DC single rail track circuits on 25 KV 50 Hz AC electrified sections.
- 1.2 This choke coil is to be used as a protective device at the feed end of the DC single rail track circuit to afford protection to track circuit components from the influence of 50 Hz AC current likely to flow through the rails.

2. TERMINOLOGY:

For the purpose of this standard, the following definitions shall apply:

- 2.1 Type Tests: Tests carried out to prove conformity with the requirements of this standard. These are intended to prove the general qualities and design.
- 2.2 Acceptance Tests: Tests carried out on samples selected from a lot for the purpose of acceptance of the lot.
- 2.3 Routine Tests: Tests carried out to check the requirements which are likely to vary during production.
- 2.4 Lot: All the choke coils manufactured by the same factory during the same period using same process and materials.

3. REQUIREMENTS

- 3.1 **General:** The choke coil is constituted of a winding mounted on a laminated core. The winding with its core assembly is placed inside a metal housing which is dust-proof but with ventilation louvers. The housing shall be so designed that it can be fixed on a horizontal board.
- 3.2 **Materials:** The components shall be constructed from materials free from flaws and other defects. The materials used shall be non-flammable, non-explosive and non-corrosive.
- 3.3 **Nuts, Screws and Washers:** All nuts, screws and washers including lock washers shall be of standard sizes and threads as per IS: 4218-1968.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

- 3.4 **Finish:** All the exposed parts shall be plated, painted or otherwise protected to prevent corrosion.
- 3.5 **Workmanship:** All parts shall be manufactured in a thoroughly workman like manner and in accordance with good engineering practice.
- 3.6 **Shape and Outline Dimensions:** The shape and outline dimensions of the choke coils shall conform to the details given in the attached drawing No. SDO/RE-22.
- 3.7 **Coils**
- 3.7.1 The coil shall be mounted such that there is no relative movement between the coil and the core when the assembly is subjected to vibrations. The wire used for winding shall be annealed, enamelled copper wire conforming to IS: 4800 (Part IV)-1968. Alternatively enamelled aluminium conductor conforming to IS: 4800 (Part IV)-1968 may be used for the winding, if specified by the purchaser.
- 3.7.2 No joint shall be made in the conductor inside the coil. The coil shall be impregnated in such a way that the wire is unaffected by humidity under all conditions of service.
- 3.7.3 The 'lead in' and 'lead out' wires when copper conductor is used for the winding of the coil shall be of flexible, insulated, stranded conductors of not less than one sq. mm. The 'lead in' and 'lead out' wires shall be connected to the terminals by eyelet terminal connectors.
- 3.7.4 The termination of the leads of the choke coil, if wound with enamelled aluminium conductor, shall be done as detailed below:
- 3.7.5 The lead shall be of aluminium wire of the size used for winding of the choke coil itself.
- 3.7.6 A portion of the aluminium winding wire shall be used for lead-in and lead-out wires. Before starting winding, enamel coating shall be removed to a length sufficient enough to make 3 or 4 starting turns of the winding and for the required lead length (after the wire has been folded to 5 to 8 times). Then, this bare portion of the winding wire shall be folded 5 to 8 times (min. 5 times for wires above 0.9mm dia and upto 8 times for wires of lesser diameter). This shall be twisted and insulated with an adhesive insulation tape. At the beginning of the winding, 3 to 4 turns of this twisted and insulated wire shall be wound on the former, keeping the required lead length outside the coil. The position of the lead wire shall be fixed on the coil securely by an adhesive insulating tape.
- 3.7.7 At the finish of the winding, the same procedure as detailed above shall be followed for the last 3 to 4 turns of the coil winding and the lead out.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

- 3.7.8 The twisted lead wire outside the coils both in the lead-in and lead-out shall be provided with PVC insulating sleeves.
- 3.7.9 The free ends of the lead shall be formed into eyelets for securing to the terminals.
- 3.7.10 **Terminals of the choke coil:** The terminals shall be of brass and shall be of the top screw pillar type with insulated heads. They shall be rigidly and securely fixed on a moulded plate of aluminium of thickness 10mm. The terminals shall be of minimum 6 mm dia and shall have a length of minimum 25 mm above the moulded plate. The spacing between the terminals shall not be less than 25 mm. Each terminal shall be provided with 2 washers, 2 nuts and a check nut.
- 3.7.11 **Air gap:** If an air-gap is provided in the choke, precaution shall be taken to ensure that the air-gap does not vary. The risk of such variation is present after the passage of DC current through the winding under the effect of shock, vibration etc.

4. MARKING

Each choke shall be clearly and indelibly marked with the following:

- a) Manufacturer's name or trade mark
- b) Serial number
- c) Nominal resistance (DC)
- d) Nominal impedance
- e) Year of manufacture
- f) Any other marking as agreed to between the customer and manufacturer.

5. TESTS AND PERFORMANCE REQUIREMENTS

- 5.1 Unless otherwise specified all the electrical tests shall be carried out under ambient atmospheric conditions.
- 5.2 **Type tests:**
- 5.2.1 A minimum number of five samples shall be required for type tests. The following shall constitute type tests.
- a) Visual inspection (Clause 5.5)
 - b) Di-electric strength (Clause 5.6)
 - c) Insulation resistance (Clause 5.7)
 - d) Induced high voltage test (Clause 5.8)
 - e) Measurement of resistance and impedance (Clause 5.9)
 - f) Temperature rise test (Clause 5.10)
 - g) Climatic severities test (Clause 5.11)

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

- 5.2.2 All samples shall successfully pass all the type tests for proving conformity with the requirements of this specification. If any of the samples fails in any of the type tests, the purchaser or his nominee at his discretion may call for fresh samples not exceeding twice the original number and subject them again to all tests or to the test (s) in which failure(s) occurred. No single failure shall be permitted in the repeat test(s) for proving conformity with the requirements of this specification.
- 5.3 **Acceptance Tests:**
- 5.3.1 The following shall constitute acceptance tests and shall be carried out in the sequence given below:
- a) Visual inspection (Clause 5.5)
 - b) Di-electric strength (Clause 5.6)
 - c) Insulation resistance (Clause 5.7)
 - d) Induced high voltage test (Clause 5.8)
 - e) Measurement of resistance and impedance (Clause 5.9)
 - f) Temperature rise test (Clause 5.10)
- 5.3.2 The acceptance tests shall be carried out on a limited number of samples in accordance with the sampling procedure given in Appendix 'B'.
- 5.4 **Routine Tests:**
- 5.4.1 The following shall constitute routine tests:
- a) Visual inspection (Clause 5.5)
 - b) Di-electric strength (Clause 5.6)
 - c) Insulation resistance (Clause 5.7)
 - d) Measurement of resistance and impedance (Clause 5.9)
- 5.4.2 The manufacturer shall certify that all the routine tests have been successfully carried out on the chokes offered for inspection.
- 5.5 **Visual inspection:** The choke shall be visually inspected for conformity with the requirements of clauses 3 & 4 of this specification.
- 5.6 **Die-electric Strength:** The assembled apparatus must withstand a 50 Hz sinusoidal AC voltage of 2000V (RMS) applied between the coil and the body of the apparatus. This voltage shall be maintained for one minute without breakdown. The dielectric strength test shall be carried out after the temperature rise test.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

- 5.7 **Insulation resistance:** The insulation resistance shall be tested at 500V, DC applied for one minute between one of the terminals of the choke and the core of the choke or frame. The insulation resistance shall not be less than 50 megohms.
- 5.8 **Induced high voltage test:** The choke coil shall be subjected to high voltage between turns. This test consists of applying 200 Hz sinusoidal AC voltage of 500V to the terminals of choke coil. The voltage shall be raised from one third of the maximum value (500V) to the full value as rapidly as consistent with accurate reading of the indicating instrument. The full test voltage shall be maintained for one minute and shall then be reduced rapidly to one third of the value before being switched off. At the end of the test the choke coil shall then again be tested for insulation and the value of insulation resistance shall not be less than 50 megohms.
- 5.9 **Resistance and Impedance:**
- 5.9.1 The value of ohmic resistance shall be $3 \text{ ohms} \pm 5\%$ when measured at 15°C . The choke coil shall have a minimum impedance of 150 ohms when measured with 50 milliamp. 50 Hz AC current passing through the choke and shall have a minimum impedance of 120 ohms under the same conditions when a direct current of 3 amps is superimposed on the choke coil.
- 5.9.2 The circuit as per SDO/RE-21 shall be adopted for measurement of impedance and the method to be adopted for measurement of the impedance is detailed in Appendix 'A'.
- 5.10 The maximum temperature rise permissible in any point of the choke coil shall not be more than 55°C when 6 amp AC is passed through the coil continuously for 6 hours and the temperature rise shall not be more than 35°C when 3 amp DC is passed through the coil continuously for 6 hours.
- 5.11 **Climatic severity Test:**
- 5.11.1 The climatic severity test shall be done in accordance with IS: 589 as per the sequence and severity indicated below:

Climatic Cycle	Severity		Tests to be done	Required results
	Temp.	Duration		
1. Dry heat	$70 \pm 2^{\circ}\text{C}$	16 hrs	(i) Dielectric strength (Cl. 5.6)	Shall withstand
			(ii) Insulation resistance (Cl. 5.7)	Shall be greater than 50 Megohms.
2. First Damp heat (Accelerated)	$55 \pm 2^{\circ}\text{C}$ RH90-95%	16 hrs+ 2 hrs	Insulation resistance (Cl. 5.7)	Shall be greater than 10 Megohms.
3. Cold	-10°C	2 hrs	-do-	-do-

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

4. Five Cycle of Damp heat (Accelerated)	55± 2°C RH90-95%	16 hrs+ 2 hrs	-do-	Shall be greater than one Megohm. After recovery period of 24 hrs, insulation resistance shall be greater than 10 Megohms.
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6. CONDITIONS OF SUPPLY:

- 6.1 The manufacturer shall submit five samples of choke to enable type test be carried out for assessing the conformity to the specification and got approved before taking up bulk supply.
- 6.2 Approval thus accorded shall be valid for a period of three years provided that there are no changes either in the material or in the method of manufacture.
- 6.3 Facility shall be available at the manufacturer's premises to conduct the acceptance tests as given in Clause 5.3.

7. PACKING

- 7.1 The chokes shall be so packed as to permit convenient handling and to protect against loss or damage during transit and storage.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

**APPENDIX -A
(Clause 5.9.2)**

Testing Procedure:

1. The switch K2 shall be kept open and the change over switch K1 shall be put at position 'B' and the regulating resistance R1 shall be adjusted such that 3 amps DC current flows through the choke. The DC supply shall then be disconnected by changing the switch K1 to position 'A'.
2. The switch K2 shall be closed and the variac shall be adjusted such that there will be a voltage of 100 V when measured with VTVM across the 2 ohms resistance R2 . This ensures the flow of 50 milliamp current through the choke. Now the voltage across the choke under test can be measured and the AC impedance calculated. This shall not be less than 150 ohms.
3. With the same setting, switch K1 shall be changed over to 'B' position so as to superimpose DC 3 amps. The voltage across the choke under test shall then be measured and the value of impedance calculated. The value of the impedance computed shall not be less than 120 ohms.

**CHOKE COIL FOR SIGNAL RAIL TRACK CIRCUITS ON
25 KV 50 Hz AC ELECTRIFIED SECTION**

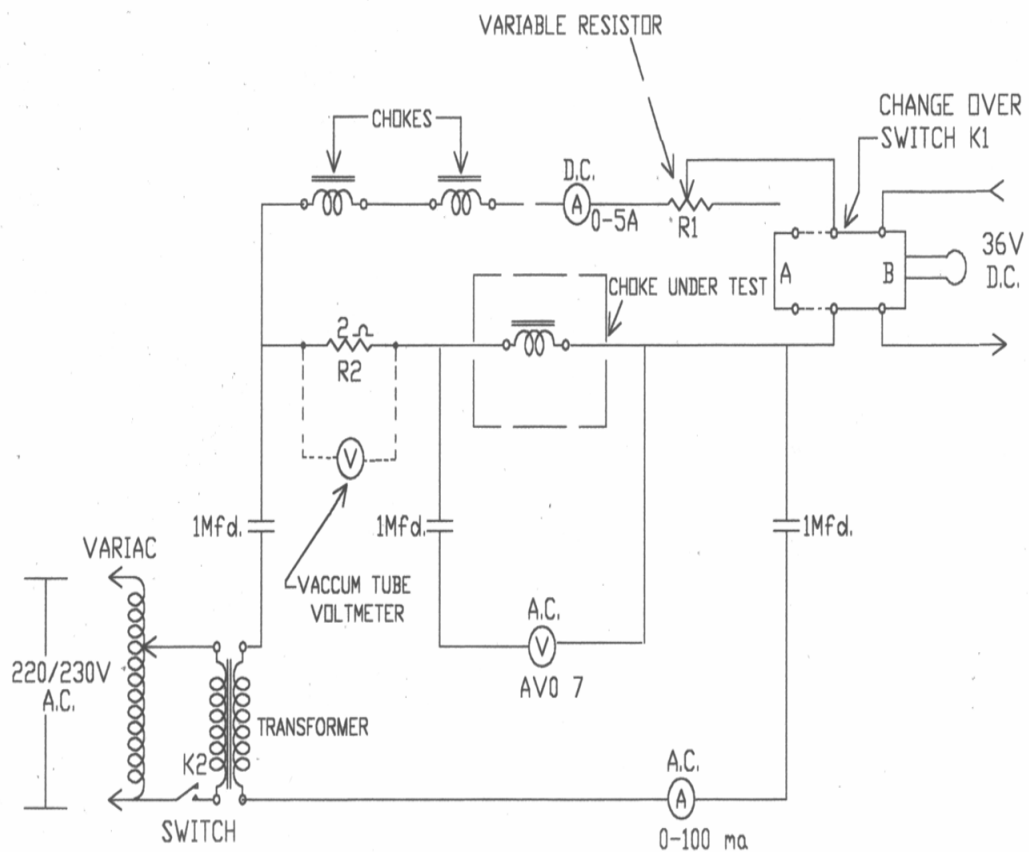
APPENDIX -B

(Clause 5.3.2)

1. Acceptance tests shall be carried out on choke coils selected at random as per the sampling plan given in the table below. N1 is the size of the first sample. In the event that the number of choke coils failing in one or more tests is less than or equal to the corresponding acceptance number (C1), the lot shall be considered as conforming to the requirements. If the number of failures is greater than or equal to rejection number (C2), the lot shall be rejected. If the number of failures is between C1 & C2, further samples of N2 pieces shall be taken and subjected to all the tests. If the total number of failures in the two samples is less than C2, the lot shall be accepted or otherwise the lot shall be rejected.

Lot size	First sample N1	Second sample N2	Combined sample N1 + N2	Acceptance No. C1	Rejection No. C2
Under 25	3	6	9	0	2
25 to 50	7	14	21	0	3
51 to 100	10	20	30	0	3
101 to 200	13	26	39	0	5
201 to 300	20	40	60	1	5
301 to 500	25	50	75		6
501 to 800	35	70	105		7
801 to 1300	50	100	150		10

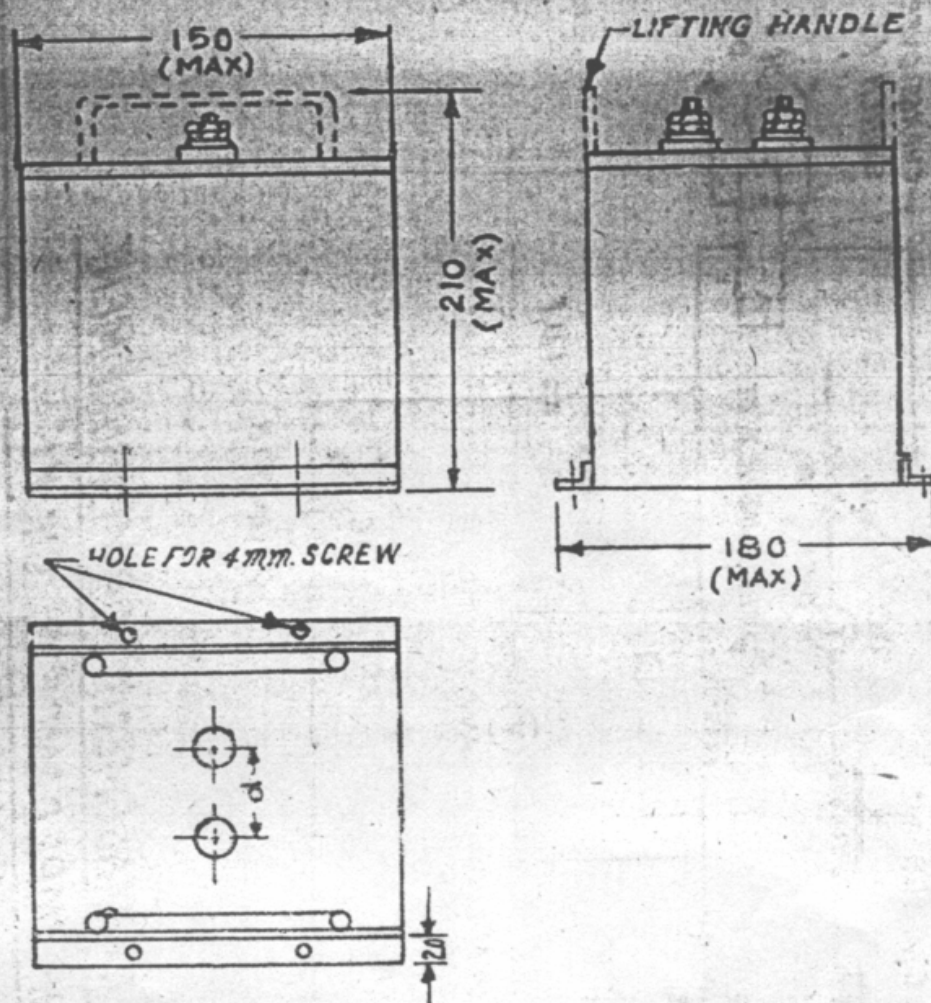
2. Facility shall be available at the manufacturers premises to conduct all the above tests. In case such facilities are not available at the manufacturers premises the manufacturer shall bear the cost of carrying out the test at an approved test laboratory.



CIRCUIT ARRANGEMENT FOR MEASUREMENT
OF IMPEDANCE OF CHOKE COIL (CLAUSE - 5.9.2)

RDSO
SDO/RE-21
SH.NO.

507/4



NOTE:

4. LIFTING HANDLE SHALL BE ELECTRO PLATED TO Fe/Cu 20 Ni80 PCT OF BS: 1224
3. THE DISTANCE Δ MUST NOT BE LESS THAN 25mm.
2. THE CONTAINER SHALL BE PROVIDED WITH SUITABLE OPENING FOR VENTILATION.
- 1 ALL DIMENSIONS IN MILLIMETRES.

DIMENSIONAL DRAWING

FOR CHOKE (CLAUSE 3.5)

SDO/RE-22

No.:STS / E / BTC / Choke

Issued dated : 20-02 -2001

Amendment No-1 to specification No. IRS S/65/ 83 for 'B' type Choke.

Amendment to specification No. IRS 65/83 is enclosed herewith for immediate implementation.

This is for your information and necessary action please.

-Sd-

**(B.S. Kalshi)
For Director General Signal**

DA: As Above

**Amendment No. 1 of February 2001
To
Indian Railways
Standard Specification for
Choke Coil single Rail Track Circuit on 25 KV 50 HZ AC Electrified Section
(Tentative)
Serial No. S 65-83**

S.No.	Clause	Amendment
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1.	C1.5. 9.1	Clause modified and may be read as under :
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“ The value of ohmic resistance shall be 3 ohms $\pm$ 5 % when measured at 15° C .
The choke coil shall have a minimum impedance of 150 ohms when measured with
50 milliamp. 50 Hz AC current passing through the choke and shall have a
minimum impedance of 120 ohms under the same condition when a direct current of
2.5 amps is superimposed on the choke coil.”

No. STS/ E/ TC/ CHOKES/0078

Issued Dated : 10-01-92

Sub: Type testing of “B” Type Choke.

Para No. 3.7.10 of specification no. IRS S 65-83 may please be read as given below.

“ 3.7.10. terminals of the Choke Coils”: -

The terminal shall be of brass and shall be of the top screw pillar type with insulated heads. They shall be rigidly and securely fixed on Hylum sheet of thickness 10mm. The terminals shall be of minimum 6 mm dia and shall have a length of minimum 25 mm. above the Hylum sheet. The spacing between the terminals shall not be less than 25m.m. Each terminal shall be provided with 2 washers, 2 nuts and a check nut.

- Sd.-

**(G.D. Chandolia)
For Director General / Signal**

DA-Nil

Sub: Amendment No. 2 to IRS: S 65/83 for 'B' type choke .

The Amendment No. 2 to IRS:S 65/83 for 'B' type choke is enclosed herewith. The amendment includes the following .

1. The dimension have been revised & made same as that of Track feed battery charger.
2. Cage type vibration proof terminals have been provided in the front in place of screw type terminal on the top. The handle on the top has been removed.
3. Vibration test has been included .
4. AC and DC superimposed impedance has been specified as 400 ohm in place of existing 150 and 120 ohm respectively .

You are requested to procure 'B' type choke as per Amendment No. 2 of the specification . There will be no financial implications with incorporation of amendment 2 .

- Sd -

(Balbir Singh Tahim)
For Director General / Signal

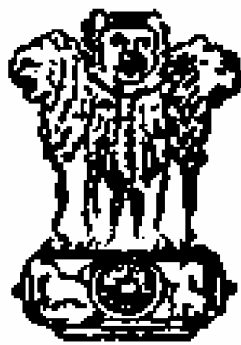
DA- Amendment No. 2

Amendment 2 to IRS : S 65 / 83 for “B”Type Choke

Cl. No.	Existing Cl.	Amended Cl.
0.2	IS: 589-Basic climatic & mechanical durability tests for components for electronic and electrical equipment.	IS: 9000-Basic environmental testing procedure for electronic and electrical items.
	IS: 4800 Pt.IV-Enamelled round winding wires Pt.IVwires with high mechanical properties.	IS: 13730 Pt.0 Sec. 1 –Specification for particulars type of winding wires (enamelled round copper wires)
3.4	Finish –All the exposed parts shall be plated, painted or otherwise protected to prevent corrosion.	All the exposed parts shall be plated, epoxy powder coated paint finish of light gray colour or otherwise protected to prevent corrosion.
3.6	Shape and outline dimensions- The shape and outline dimensions of the choke coils shall conform to the details given in the attached drg. No. SDO/RE-22.	Shape and outline dimensions- The shape and outline dimensions of the choke coils shall conform to the details given in the attached drg. No. SDO/RE-22. Note: Overall dimensions shall be restricted to a) Height 180 +- 5mm b) Width 155 +- 5mm c) Length 155 +- 5mm
3.7.10	Terminals of the choke coil- The terminals shall be of brass and shall be of the top screw pillar type with insulated heads. They shall be rigidly and securely fixed on a moulded plate of thickness 10 mm. The terminals shall be of minimum 6-mm dia and shall have a length of minimum 25 mm above the moulded plate. The spacing between the terminals shall not be less than 25 mm. Each terminal shall be provided with 2 washers, 2 nuts and a check nut.	The terminals of the choke coil shall be CAGE type, vibration proof reliable and fast, suitable for 2.5 Sq. mm conductor, with spring loaded contacts against the conductor, provided on front panel as per Drg. No. SDO/RE/22. The terminals shall be mounted on DIN RAILS.
5.2.1	A minimum number of five samples shall be required for type tests. The following shall constitute type tests. a) Visual Inspection (Cl. 5.5) b) Di-electric Strength (Cl. 5.6) c) Insulation resistance (Cl. 5.7) d) Induced high voltage test (Cl. 5.8) e) Measurement of resistance and	A minimum number of two samples shall be required for type tests. The following shall constitute type tests. a) Visual Inspection (Cl. 5.5) b) Di-electric Strength (Cl. 5.6) c) Insulation resistance (Cl. 5.7) d) Induced high voltage test (Cl. 5.8) e) Measurement of resistance and impedance (Cl. 5.9)

	impedance (Cl. 5.9) f) Temperature rise test (Cl. 5.10) g) Climatic severities test (Cl. 5.11)	f) Temperature test (Cl. 5.10) g) Vibration test (Cl. 5.12) h) Climatic severities test (Cl. 5.11)
5.8	Induced high voltage Test – The choke coil shall be subjected to high voltage between turns. This test consists of applying 200 Hz sinusoidal AC voltage of 500V to the terminals of choke coil. The voltage shall be raised from one third of the maximum value (500V) to the full value as rapidly as consistent with accurate reading of the indicating instrument. The full test voltage shall be maintained for one minute and shall then be maintained for one minute and shall then be reduced rapidly to one third of the value before being switched off. At the end of the test the choke coil shall then again be tested for insulation and the value of insulation resistance shall not be less than 50 meg ohms.	Induced high voltage test-The choke coil shall be subjected to high voltage between turns. This test consists of applying 200 Hz sinusoidal AC voltage of 500V to the terminals of choke coil. The voltage shall be raised from one third of the maximum value (500V) to the full value as rapidly as consistent with accurate reading of the indicating instrument. The full test voltage shall be maintained for one minute and shall be maintained for one minute and shall then be reduced rapidly to one third of the value before being switched off. At the end of the test the choke coil shall then again be tested for insulation and the value of insulation resistance shall not be less than 50 meg ohms.
5.9.1	The value of ohmic resistance shall be 3 ohms $\pm$ 5% when measured at 15 deg. C. the choke coil shall have a minimum impedance of 150 ohms when measured with 50 milli amp. 50 Hz AC current passing through the choke and shall have a minimum impedance of 120 ohms under the same conditions when a direct current of 2.5 amps is superimposed on the choke coil.	The value of ohmic resistance shall be 3 ohms $\pm$ 5% when measured at 20 deg. C. The choke coil shall have a minimum impedance of 400 ohms when measured with 50 milli amp. 50 Hz AC current passing through the choke and shall have a minimum impedance of 400 ohms under the same conditions when a 2.5 amps DC current is superimposed on the choke coil.
5.10	The maximum temperature rise permissible in any point of the choke coil shall not be more than 55 deg. C when 6 amp AC is passed through the coil continuously for 6 hours and the temperature rise shall not be more than 35 deg. C when 3 amps DC is passed through the coil continuously for 6 hours.	The temperature rise shall not be more than 50 deg. C when direct current of 2.5 amp is passed through the coil continuously for 6 hours.
5.12		Vibration Test The choke shall be subjected to the vibration test (sinusoidal) as per IS : 9000 Pt. VIII with following severities. i) Frequency range 1.35 Hz ii) Amplitude 0.35 or 5g iii) No. of Axes 3 iv) No. of sweep cycle 10

		v) Total duration 1 hr 45 min vi) If resonance is observed vibration test at resonant frequency at each resonant frequency. 10 Minutes After the test the choke shall be visually inspected for any mechanical damages. The electric parameters shall be measured as per Cl. 5.9.1
5.11.1	The climatic severity test shall be done in accordance with IS : 589 as per the sequence and severity indicated below. (Table as it is)	The climatic severity test shall be done in accordance with IS : 9000 as per the sequence an severity indicated below. (Table as it is)
Appendix 'A' Clause 5.9.2 and sketch SDO/R E-21	The switch K2 shall be kept open and the change over switch K1 shall be put at position 'B' and the regulating resistance R1 shall be adjusted such that 3 amps DC current flows through the choke. The DC supply shall then be disconnected by changing the switch K1 to position 'A'.	The switch K2 shall be kept open and the change over switch K1 shall be put at position 'B' and the regulating resistance R1 shall be adjusted such that 2.5 amps DC current flows through the choke. The DC supply shall then be disconnected by changing the switch K1 to position 'A'.
	The switch K2 shall be closed and the variac shall be adjusted such that there will be a voltage of 100 V when measured with VTVM across the 2 ohms resistance R2. This ensures the flow of 50 milli amp current through the choke. Now the voltage across the choke under test can be measured and the AC impedance calculated. This shall not be less than 150 ohms. With the same setting, switch K1 shall be changed over to 'B', position so as to superimpose DC 3 amps. The voltage across the choke under test shall then be measured and the value of impedance calculated. The value of the impedance computed shall not be less than 120 ohms.	The switch K2 shall be closed and the variac shall be adjusted such that there will be a voltage of 100 mV when measured with true r.m.s. digital multimeter across the 2 ohms resistance R2. This ensures the flow of 50 milli amp current through the choke. Now the voltage across the choke under test can be measured and the AC impedance calculated. This shall not be less than 400 ohms. With the same setting, switch K1 shall be changed over to 'B', position so as to superimpose DC 2.5 amps. The voltage across the choke under test shall then be measured and the value of impedance calculated. The value of the impedance computed shall not be less than 400 ohms.



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**INDIAN RAILWAY STANDARD SPECIFICATION
FOR
CHOKE COIL FOR SINGLE RAIL TRACK CIRCUITS
ON 25 KV 50 Hz AC ELECTRIFIED SECTION
(TENTATIVE)**

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**SIGNAL DIRECTORATE
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Abstract This document specifies Technical specification for Choke coil for single rail track circuits on 25 kV 50 Hz AC electrified section.			

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AMENDMENTS

Version	Chapter/ Annexure	Amendment	Effective date
IRS: S-65/1983	-	FIRST ISSUE	1983
IRS: S-65/1983	-	Amendment-1	February 2001
IRS: S-65/1983	-	Amendment-2	June 2002 (Implementation of the Amendment was postponed vide letter No. STS/E/BTC/Chokes dated 28.7.03) Withdrawn vide Amendment-3.
IRS: S-65/1983	-	Amendment-3	01.06.2009

CHOKE COIL FOR SINGLE RAIL TRACK CIRCUITS ON 25 KV 50 Hz AC ELECTRIFIED SECTION

Specification No. IRS: S 65-1983 (Amendment No. 3)

- I.** Amendment No. 2 has been withdrawn.
- II.** The amended / added/deleted clauses and appendices are given below:
- 1. Clause No. 0.2 :**

Following specifications are added / deleted-

- IS: 589 Basic climatic & mechanical durability tests for components for electronic and electrical equipment- **(Deleted)**
- IS: 9000 Basic environmental testing procedure for electronic and electrical items- **(Added)**

2. Clause No. 3.7.10:

Terminals of the choke coil: The terminals shall be of brass and shall be of the top screw pillar type with insulated heads. They shall be rigidly and securely fixed on Hylum sheet of thickness 10mm. The terminals shall be of minimum 6 mm dia and shall have a length of minimum 25 mm above the Hylum sheet. The spacing between the terminals shall not be less than 25 mm. Each terminal shall be provided with 2 washers, 2 nuts and a check nut.

3. Clause No. 5.10:

The temperature rise shall not be more than 50°C when 2.5 Amp. DC is passed through the coil continuously for 6 hours.

4. Clause No. 5.11.1:

5.11.1 The climatic severity test shall be done in accordance with **IS: 9000** as per the sequence and severity indicated below:

Climatic Cycle	Severity		Tests to be done	Required results	Reference
	Temp.	Duration			
1. Dry heat	70± 2°C	16 hrs	(i) Dielectric strength (Cl. 5.6)	Shall withstand	IS 9000 Part III Sec. 3
			(ii) Insulation resistance (Cl. 5.7)	Shall be greater than 50 Megohms.	
2. Damp heat (Accelerated)	55± 2°C RH90-95%	16 hrs+ 2 hrs (6 cycles)	Insulation resistance (Cl. 5.7)	Shall be greater than 10 Megohms.	IS 9000 Part V Sec. 2 Variant 1
3. Cold	-10° C	2 hrs	-do-	-do-	IS 9000 Part II Sec. 3

CHOKE COIL FOR SINGLE RAIL TRACK CIRCUITS ON 25 KV 50 Hz AC ELECTRIFIED SECTION

6. Clauses 6, 6.1, 6.2 and 6.3 are deleted.

7. **Appendix-A:**

3 Amp. DC current is modified as 2.5 amp. DC current in para 1 & 3. There is no other change in this appendix.

Modified Appendix A is reproduced below -

APPENDIX -A
(Clause 5.9.2)

Testing Procedure:

1. The switch K2 shall be kept open and the change over switch K1 shall be put at position 'B' and the regulating resistance R1 shall be adjusted such that 2.5 amp DC current flows through the choke. The DC supply shall then be disconnected by changing the switch K1 to position 'A'.
2. The switch K2 shall be closed and the variac shall be adjusted such that there will be a voltage of 100 V when measured with VTVM across the 2 ohms resistance R2 . This ensures the flow of 50 milliamp current through the choke. Now the voltage across the choke under test can be measured and the AC impedance calculated. This shall not be less than 150 ohms.
3. With the same setting, switch K1 shall be changed over to 'B' position so as to superimpose 2.5 amps DC. The voltage across the choke under test shall then be measured and the value of impedance calculated. The value of the impedance computed shall not be less than 120 ohms.

8. **Appendix-B** is amended as given below-

APPENDIX -B
(Clause 5.3.2)

Acceptance tests shall be carried out on choke coils selected at random as per the sampling plan given in the table below-

Lot size	Sample Size
Under 25	3
25 to 50	7
51 to 100	10
101 to 200	15

- Note: i. All the chokes of the same type manufactured by the same factory during the same period shall constitute a lot.*
- ii If a lot consists of more than 200 chokes, the lot shall be divided into smaller lots consisting of the above lot sizes.*
- iii. None of the samples shall fail, otherwise the lot shall be considered as not conforming to the requirement of the specification and rejected.*

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